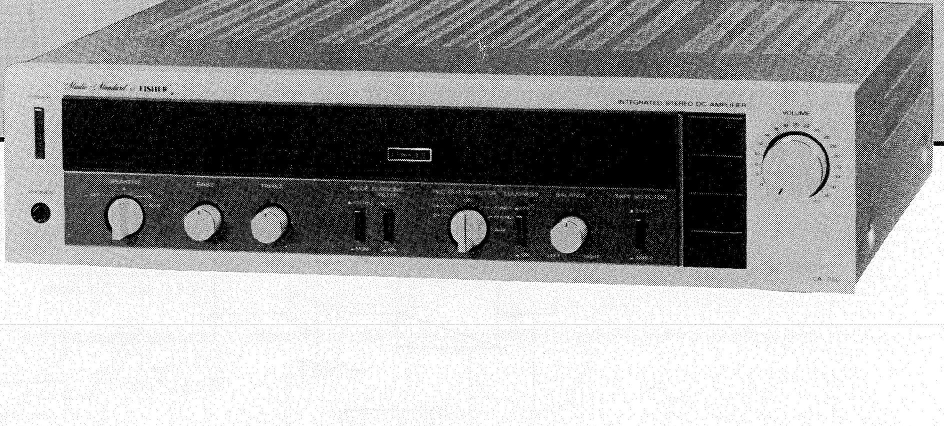
SERVICE MANUAL

FISHER

CA-350

Integrated Stereo
DC Amplifier
(EUROPE)

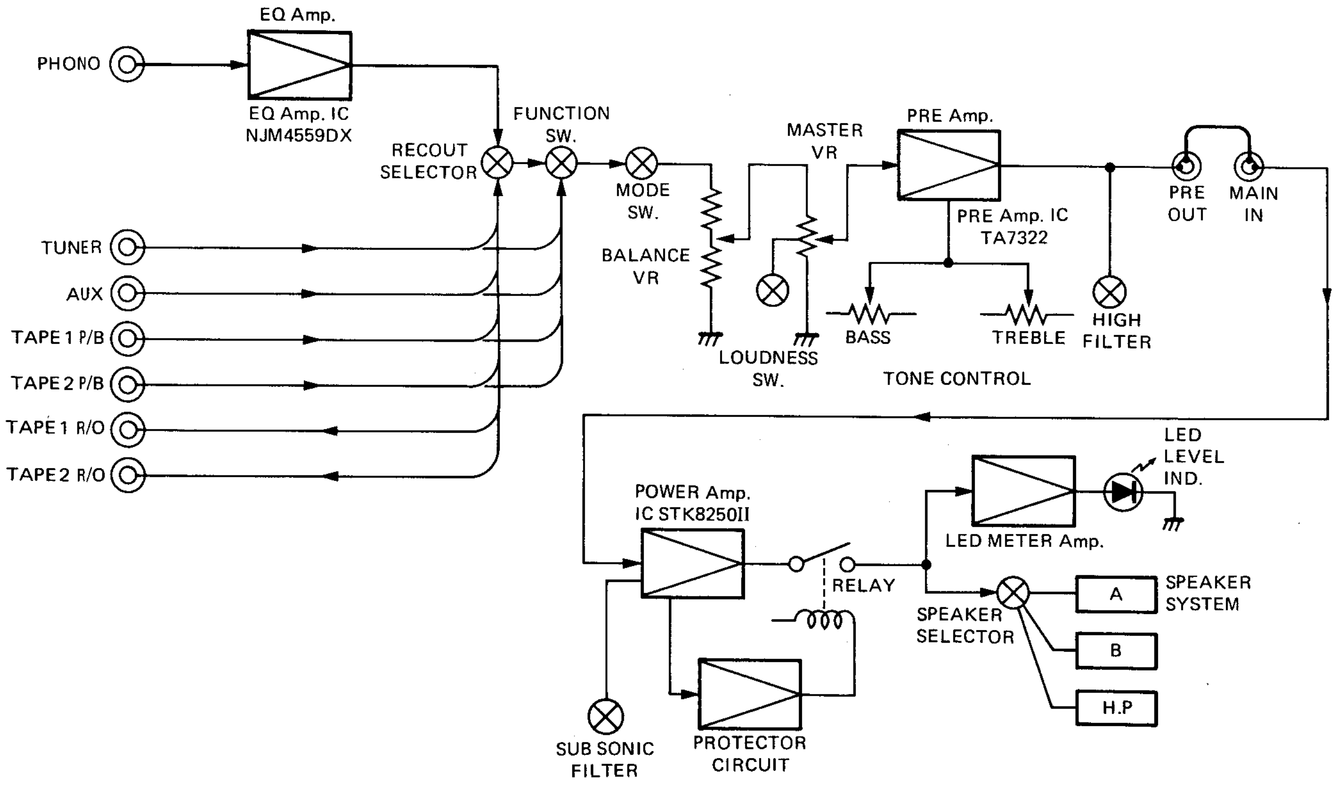


The first name in high fidelity

CONTENTS

Functional Block Diagram 2
Specifications 3
Cabinet & Chassis Exploded View 4
Parts List 5
Recommended Test Equipments 6
Harmonic Distortion Test 6
Adjustment of Power Amplifier P.C.Board 7
Power Amp Board Layout (Bottom View) 7
Explanation of Protective Circuits 8
Adjustment of Power Level Ind. P.C.Board 8
Level Ind. P.C.Board Layout (Top View) 8
IC Equivalent Circuit & Block Diagram 9,10
Function, Pre Amplifier, and Phono/Tape Select P.C.Board (Bottom View) 11,12
Main, EQ, Power Supply P.C.Board (Bottom View) 13,14
Level Ind., L.E.D., Headphone Jack, and Volume Control P.C.Board (Bottom View) 15,16
RCA Pin/DIN and Fuse P.C.Board (Bottom View) 17
Parts List 18,19,20
Point to Point Wiring Diagram 21,22
Schematic Diagram 23,24
Semiconductor Lead Identification 25

FUNCTIONAL BLOCK DIAGRAM



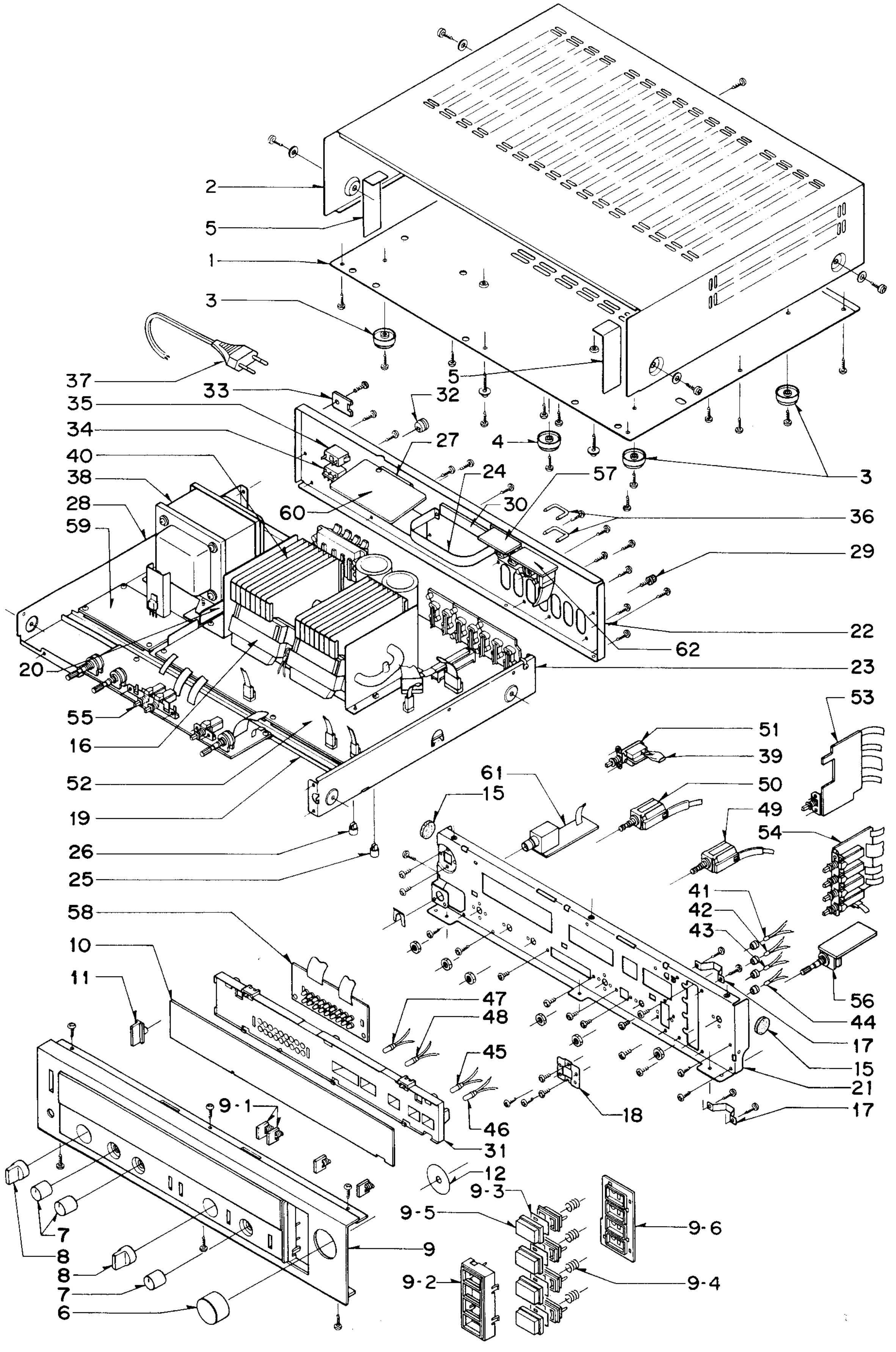
EQ Amp.
PHONO
EQ Amp. IC
NJM4559DX
RECOUT
SELECTOR
FUNCTION
SW.
MODE
SW.
BALANCE
VR
MASTER
VR
LOUDNESS
SW.
PRE Amp.
PRE Amp. IC
TA7322
BASS
TREBLE
TONE CONTROL
HIGH
FILTER
PRE
OUT
MAIN
IN
TUNER
AUX
TAPE 1 P/B
TAPE 2 P/B
TAPE 1 R/O
TAPE 2 R/O
POWER Amp.
IC STK8250II
RELAY
SUB SONIC
FILTER
PROTECTOR
CIRCUIT
LED
LEVEL
IND.
LED METER Amp.
SPEAKER
SELECTOR
A
B
H.P
SPEAKER
SYSTEM

SPECIFICATIONS

AMPLIFIER		CA-350
Sine Wave Power		
	at 1000 Hz (8 ohms)	2 x 60 W
	20 to 20,000 Hz (8 ohms)	2 x 50 W
Music Power (8 ohms)		2 x 70 W
THD (rated output)		0.009 %
IM (rated output)		0.009 %
Power Bandwidth		20 Hz – 20 kHz
Frequency Response (20 Hz – 20 kHz)		±0.5 dB
Damping Factor (8 ohms)		> 50
Input Sensitivity and Impedance		
	Phono	2.5 mV/50 kohms
	Tape	150 mV/50 kohms
	Tuner	150 mV/50 kohms
	Auxiliary	150 mV/50 kohms
	Main Amp.	1000 mV/100 kohms
S/N Ratio (DIN)		
	Phono	75 dB
	Tape/Tuner/Aux	95 dB
	Main Amp.	100 dB
Treble Control (10 kHz)		±10 dB
Bass Control (100 Hz)		±10 dB
Loudness Control (100 Hz/10 kHz)		+8 dB/+4 dB
Subsonic Filter (below 10 Hz)		12 dB/Oct.
Voltage and Impedance Pre Amp. Out		1000 mV/2.2 kohms
Power Requirements		AC: 110/220 V, 50/60 Hz
Power Consumption		230 W
Dimensions (W x D x H)		440 x 370 x 110 mm
Weight (approx.)		7.8 kg

*** Specifications are subject to change without notice.**

CABINET & CHASSIS EXPLODED VIEW



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9-1
18
46
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31
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9-3
9-5
9-6
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8
7
9-2
9-4
6

PARTS LIST

PACKING PARTS LIST

Ref. No.	Parts Number	Description
	131 6 1139 89705	Box Corrugate-EXP
	131 6 2119 01362	Bag Polyethylene-EXP
	131 6 3009 32190	Pad (Right)
	131 6 3009 32200	Pad (Left)
	131 6 3009 32440	Pad (Bottom)

ACCESSORIES PARTS LIST

Ref. No.	Parts Number	Description
	131 6 2719 10801	Bag Fan
	131 6 4119 87302	Explanatory Booklet
	131 6 4519 15700	Guarantee Certificate

CABINET PARTS LIST

Ref. No.	Parts Number	Description
1	131 2 1105 27600	Plate Bottom
2	131 2 1410 26200	Cover
3	131 2 1801 12900	Leg
4	131 2 1801 13300	Leg
5	131 2 3202 13400	Metal Reinforce (Cover)

APPEARANCE PARTS LIST

Ref. No.	Parts Number	Description
6	131 0 1001 59100	Knob (Volume)
7	131 0 1001 59200	Knob (Balance, Bass, Treble)
8	131 0 1001 59300	Knob, Select (SP, Rec Out)
9	131 0 1016 38606	Panel Decorative Assy
9-1	131 0 1001 60000	Knob (Push)
9-2	131 2 6113 43600	Shelter
	131 2 1205 25400	Decorative Plate Dial
	131 2 1116 20200	Frame
	131 2 1601 69900	Knob
9-3	131 2 1310 37810	Name Plate (Tuner)
	131 2 1310 37811	Name Plate (Aux)
	131 2 1310 37812	Name Plate (Phono)
	131 2 1310 37813	Name Plate (Tape)
9-4	131 2 5101 19500	Spring
9-5	131 2 1601 70000	Knob (Base)
9-6	131 2 6110 30000	Shelter Light
10	131 2 1201 36303	Plate Dial
11	131 2 1601 69500	Knob (Power Switch)
12	131 2 6113 31800	Shelter (Volume, SP Select)

CHASSIS PARTS LIST

Ref. No.		Parts Number	Description
15		131 2 1801 13900	Leg
16	*	131 2 3101 78000	Metal Mount (IC)
17	*	131 2 3101 78100	Metal Mount (Panel Front)
18	*	131 2 3101 78200	Metal Mount (Panel Front)
19	*	131 2 3202 13700	Metal Reinforce
20	*	131 2 3202 13900	Metal Reinforce
21	*	131 2 3305 31200	Panel Front
22	*	131 2 3306 34601	Panel Rear
23	*	131 2 3315 10300	Panel Side
24	*	131 2 3605 10600	Metal Mount
25	*	131 2 3614 20300	Mount P.C.B.
26	*	131 2 3614 22900	Mount P.C.B.
27	*	131 2 3614 24400	Mount P.C.B.
28	*	131 2 3617 18400	Metal Mount Transformer
29		131 2 4201 17800	Screw (GND)
30		131 2 5205 26000	Cushion
31		131 2 6110 30100	Shelter Light
32		131 2 6111 14200	Bushing
33		131 2 7104 00500	Plate Pad Switch

ELECTRICAL PARTS LIST

Ref. No		Parts Number	Description
34	⚠	4 2312 01020	Switch Slide
35	⚠	4 2352 00450	AC Outlet
36		4 2369 21220	Short Plug
37	⚠	4 2432 00070	Line Cord
38	⚠	4 2512 14820	Power Transformer
39		131 2 6114 00200	Cover Safety
40		131 2 6203 00101	Heat Pipe
41		4 6122 02500	Pilot Lamp (8V, 40 mA)
42		4 6122 02600	Pilot Lamp (8V, 40 mA)
43		4 6122 02500	Pilot Lamp (8V, 40 mA)
44		4 6122 02600	Pilot Lamp (8V, 40 mA)
45		4 6122 00100	Pilot Lamp (8V, 60 mA)
46		4 6122 00200	Pilot Lamp (8V, 60 mA)
47		4 6122 00130	Pilot Lamp (8V, 60 mA)
48		4 6122 01310	Pilot Lamp (6.3V, 80 mA)
49		4 2312 02570	Joint Switch Rotary
50		4 2312 02590	Joint Switch Rotary
51	⚠	4 2312 02520	Switch Push Power
52	*	131 0 4001 07056	Main, EQ, Power P.C.B. Assy
53	*	131 0 4001 07111	Tape Select P.C.B. Assy
54	*	131 0 4001 07100	Function P.C.B. Assy
55	*	131 0 4001 07091	Pre Amp P.C.B. Assy
56	*	131 0 4001 07161	Volume P.C.B. Assy
57	*	131 0 4001 07063	RCA Pin P.C.B. Assy
58	*	131 0 4001 07130	L.E.D. P.C.B. Assy
59	*	131 0 4001 07124	Level Ind. P.C.B. Assy
60	*	131 0 4001 07141	Fuse P.C.B. Assy
61	*	131 0 4001 07084	Headphone P.C.B. Assy
62	*	131 0 4001 07150	DIN P.C.B. Assy
C01	⚠	C2GYDP103A	Ceramic 0.01 μF 400V +100,–0%

*—Not a service part.

PRODUCT SAFETY NOTICE

PRODUCT SAFETY SHOULD BE CONSIDERED WHEN A COMPONENT REPLACEMENT IS MADE IN ANY AREA OF AN UNIT. COMPONENTS INDICATED BY A MARK ⚠ IN THIS PARTS LIST AND THE SCHEMATIC DIAGRAM SHOW COMPONENTS WHOSE VALUE HAS SPECIAL SIGNIFICANCE TO PRODUCT SAFETY. IT IS PARTICULARLY RECOMMENDED THAT ONLY PARTS SPECIFIED ON THE FOLLOWING PARTS LIST BE USED FOR COMPONENT REPLACEMENT POINTED OUT BY THE MARK.

RECOMMENDED TEST EQUIPMENTS

The following test equipments are recommended to completely test and align the Amplifier:

- Line Voltage Isolation Transformer
- AC DC Multimeter.
- Accurately Calibrated AC Voltmeter.
- Oscilloscope (Flat to 100 kHz Minimum)
- Low-Distortion Audio Sine-Wave Generator
- Harmonic Distortion Analyzer
- Two (2) Load Resistors 8-ohms, 250 Watts (Minimum Rating)

HARMONIC DISTORTION TEST

CAUTION: Limit the following tests to no more than ten minutes each. Use 8-ohm resistors, with a minimum power rating of 250 watts when connecting a load across the SPEAKERS terminal.

CONTROL SETTINGS:

Unplug the AC power cord and set the front panel controls as follows:

- BALANCE controls to center positions.
- POWER switch to OFF
- SPEAKERS switch to OFF
- FUNCTION switch to AUX
- MODE switch to STEREO
- TAPE MONITOR switch to SOURCE
- FILTERS switch to OFF
- LOUDNESS switch to OFF
- VOLUME control to MINIMUM position
- LEFT CHANNEL DRIVEN

ONE CHANNEL DRIVEN:

1) Connect a low distortion audio generator to LEFT AUX IN jack. Set generator frequency to 1 kHz and output to minimum.

2) Connect an 8-ohm load resistor between SPEAKERS MAIN LEFT and COM terminals. Connect a Harmonic Distortion Analyzer and an AC VTVM in parallel across the 8-ohm load.

3) Connect the AC power cord and set SPEAKERS switch to MAIN. Turn VOLUME control to MAX.

4) Increase generator output for 50 Watts RMS (20.0 V across the 8-ohm load). Harmonic Distortion Analyzer should measure 0.009 % distortion or less.

5) Repeat steps 1 through 4 for RIGHT CHANNEL.

BOTH CHANNELS DRIVEN

Connect 8-ohm load resistors across LEFT and RIGHT MAIN SPEAKERS terminals. Set MODE switch to "MONO". Adjust generator output and "BALANCE" control for 50 Watts at Left and Right Channels (20.0 volts across the 8-ohm loads). Harmonic Distortion Analyzer should measure 0.009 % distortion or less at each channel.

CAUTION: This precision high-fidelity instrument should be serviced only by qualified personnel, trained in the repair of transistor equipment and printed circuitry.

ADJUSTMENT OF POWER AMPLIFIER P.C.BOARD

BEFORE ADJUSTMENT

1) After the power switch is turned ON, allow a few minutes before making adjustment, to be sure of the most stable operation.

2) Connect dummy load resistors (8 ohms) to the SPEAKERS terminals.

3) Use a DC V.T.V.M. (input impedance: More than 50k ohms/V.)

4) Keep VR01 and VR02 in the mechanical center position.

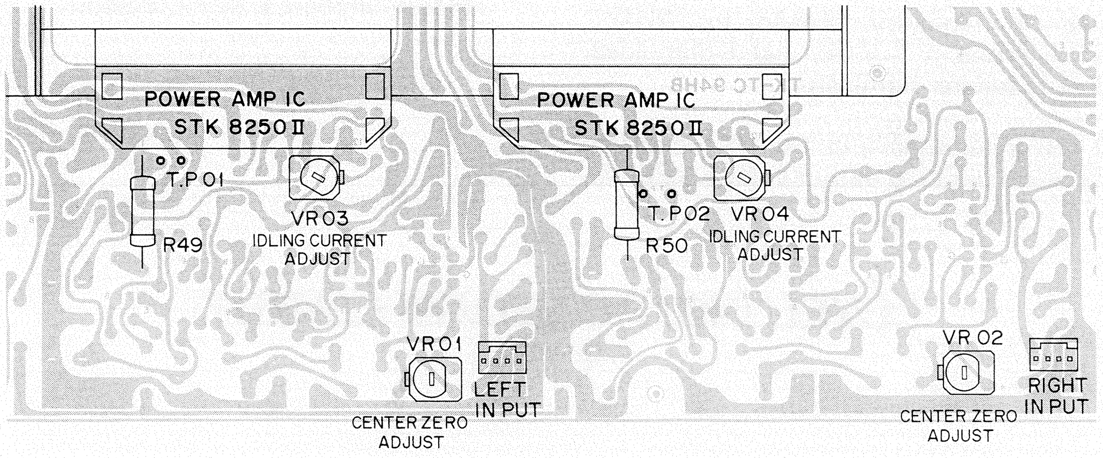
5) Set the unit under no-signal condition by turning down the volme control of the unit.

ZERO BALANCE ADJUSTMENT

- Connect DC V.T.V.M. to the Speaker output terminal and turn the volume control fully to the minimum position. Turn VR01 (left), VR02 (right) in P.C.B. under the above condition until the output voltage becomes 0 V.

POWER AMP BOARD LAYOUT

(TOP VIEW)


POWER AMP IC
STK 8250Ⅱ
T.P01
R49
VR03
IDLING CURRENT ADJUST
POWER AMP IC
STK 8250Ⅱ
T.P02
VR04
R50
IDLING CURRENT ADJUST
VR01
LEFT IN PUT
CENTER ZERO ADJUST
VR 02
RIGHT IN PUT
CENTER ZERO ADJUST

IDLING CURRENT ADJUSTMENT

1) Connect the DC Voltmeter to TP01 (left) and TP02 (right) in the Power Amplifier P.C.Board. Then, adjust VR03 (left) and VR04 (right) until the DC Voltmeter indicates 7 mV, so that the idling current is set to 35 mA.

2) Repeat steps (1) for optimum results.
Note: a. Turn the semi-fixed variable resistor slowly during adjustment.
b. Be careful of the polarity of each measurement point.

EXPLANATION OF PROTECTIVE CIRCUITS

*For about 5 seconds after the power switch is turned on, the speakers remain silent because the power muting circuit operates during this time.

*If the speaker terminals are short-circuited or the ventilation holes at the cabinet top are blocked during long periods of operation, the internal temperature may rise abnormally. At about 90°C, the thermal sensor (temperature detection) circuit becomes activated and will interrupt the signal. If the cause is removed and the internal temperature is back to normal, the unit automatically resets itself to restore normal operation.

ADJUSTMENT OF POWER LEVEL IND. P.C.BOARD

POWER LEVEL INDICATOR ADJUSTMENT

When IC01 (LB1409) and IC02 (LB1409) in the P.C.Board and a component in the Power Amplifier P.C.Board are replaced, perform the readjustment by the following steps.

1) Set VR01 and VR02 to the maximum position (fully turned counter-clockwise).

2) Connect the low frequency oscillator to "AUX", and the oscilloscope, V.T.V.M., and 8-ohm load resistance to the speaker terminals.

3) Feed the 1 kHz input signal into "AUX" and adjust the master volume until the output voltage becomes 0.28 V.

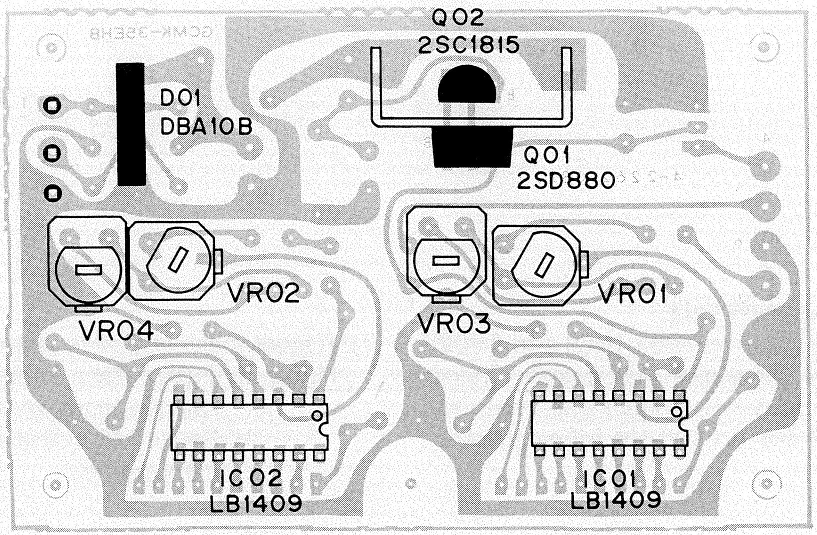
4) Adjust VR03 and VR04, so that the first L.E.D. lights up in the L.E.D. P.C.Board.

5) Change the input level and adjust the master volume for 20.0 V.

6) Adjust VR01 and VR02, so that the ninth L.E.D. lights up in the L.E.D. P.C.Board.

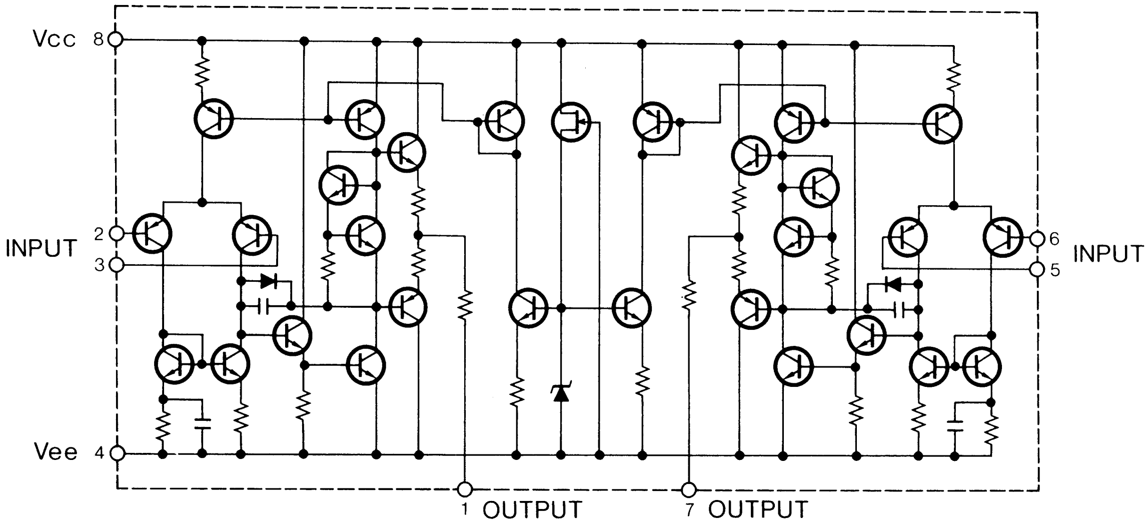
LEVEL IND. P.C.BOARD LAYOUT

(TOP VIEW)

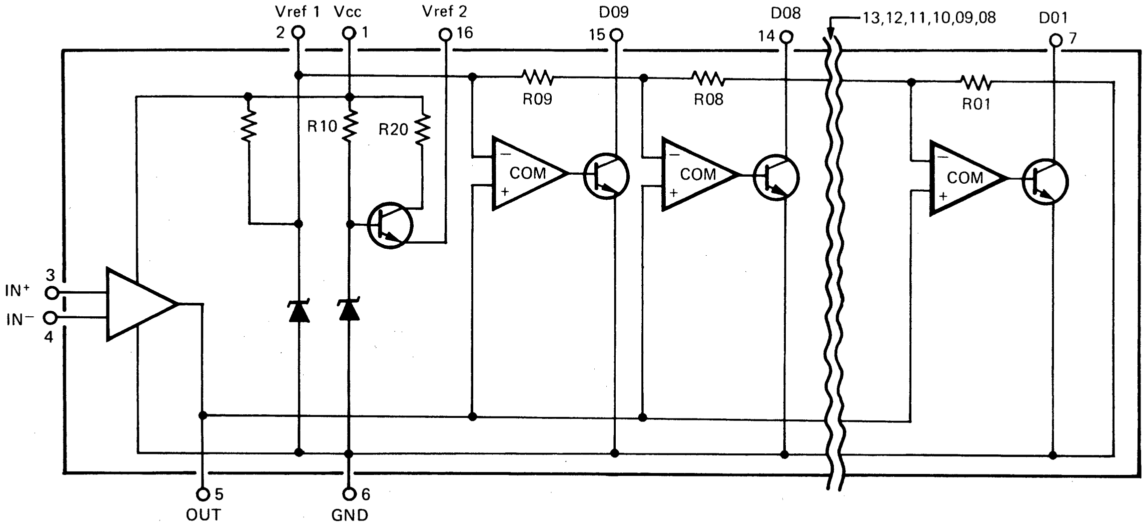


IC EQUIVALENT CIRCUIT & BLOCK DIAGRAM

EQ AMP IC NJM4559DX

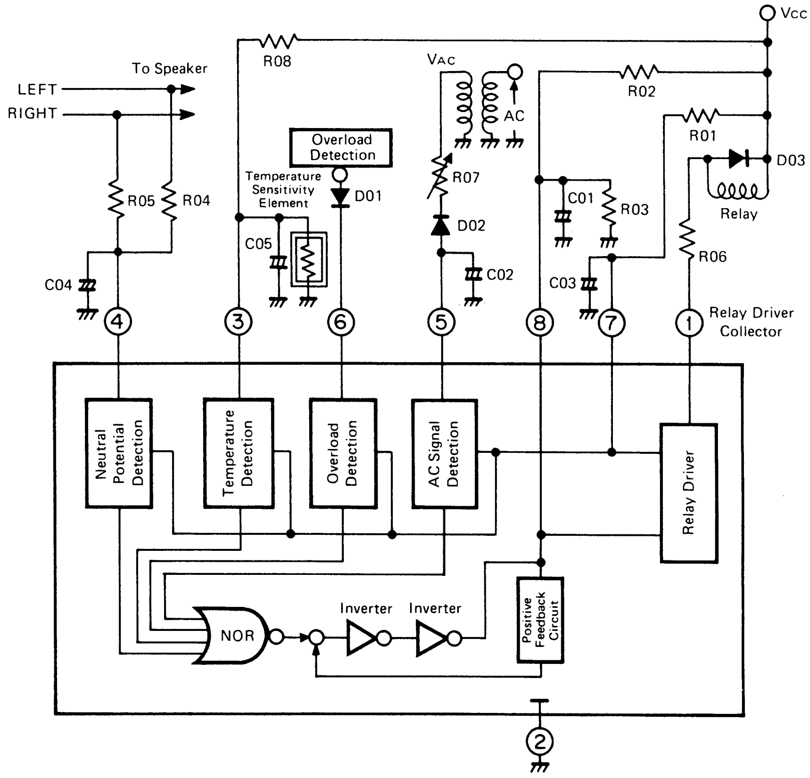

Vcc 8
INPUT 2
3
Vee 4
6 INPUT
5
1 OUTPUT
7 OUTPUT

L.E.D. LEVEL METER IC LB1409

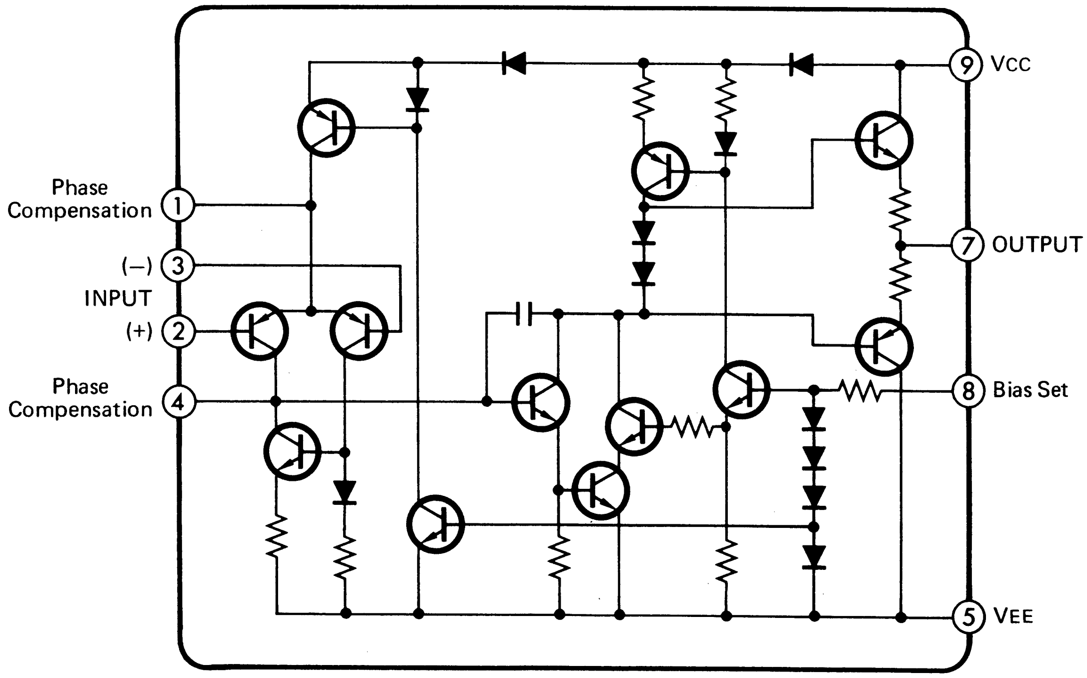

Vref 1
2
Vcc
1
Vref 2
16
D09
15
D08
14
13,12,11,10,09,08
D01
7
R09
R08
R01
R10
R20
COM
IN+ 3
IN− 4
5 OUT
6 GND

IC EQUIVALENT CIRCUIT & BLOCK DIAGRAM (Continued)

PROTECTOR CIRCUIT MONO AMP IC HA12002


Vcc
R08
To Speaker
LEFT
RIGHT
VAC
AC
R02
R01
D03
Relay
Overload Detection
Temperature Sensitivity Element
D01
R07
D02
C01
R03
R06
R05
R04
C05
C02
C03
C04
4
3
6
5
8
7
1
Relay Driver Collector
Neutral Potential Detection
Temperature Detection
Overload Detection
AC Signal Detection
Relay Driver
NOR
Inverter
Inverter
Positive Feedback Circuit
2

TONE AMP IC TA7322P


Phase Compensation
1
(–)
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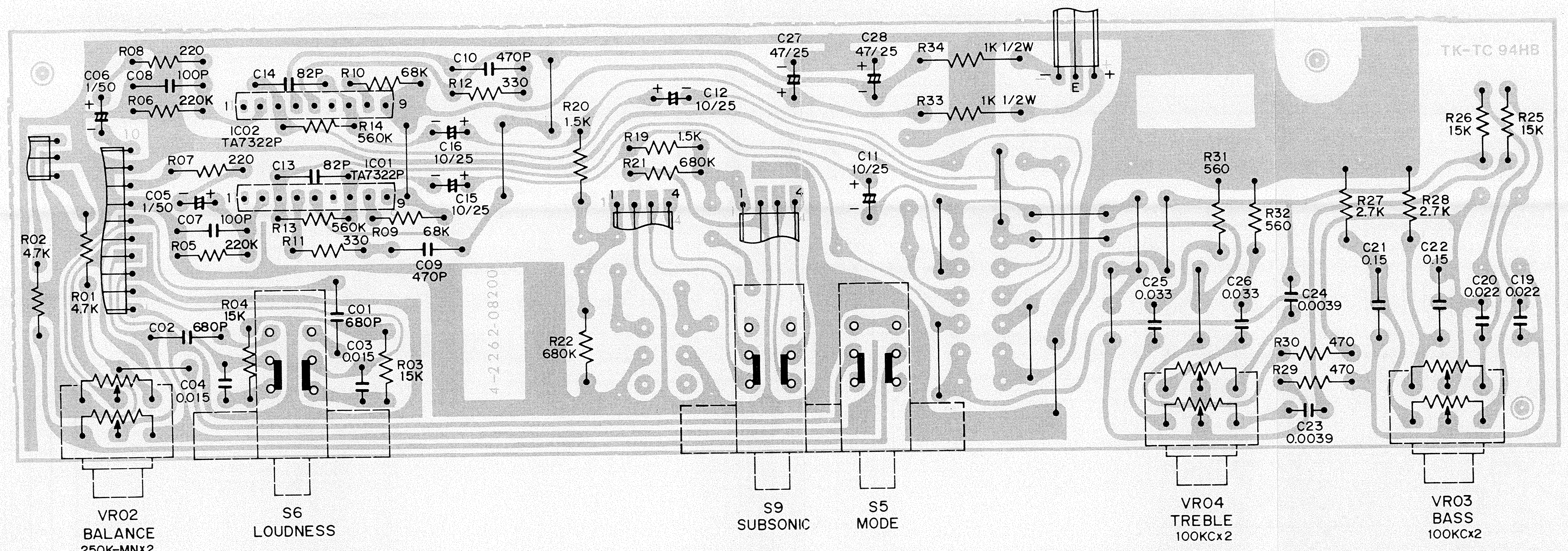
INPUT
(+)
2
Phase Compensation
4
9
VCC
7
OUTPUT
8
Bias Set
5
VEE

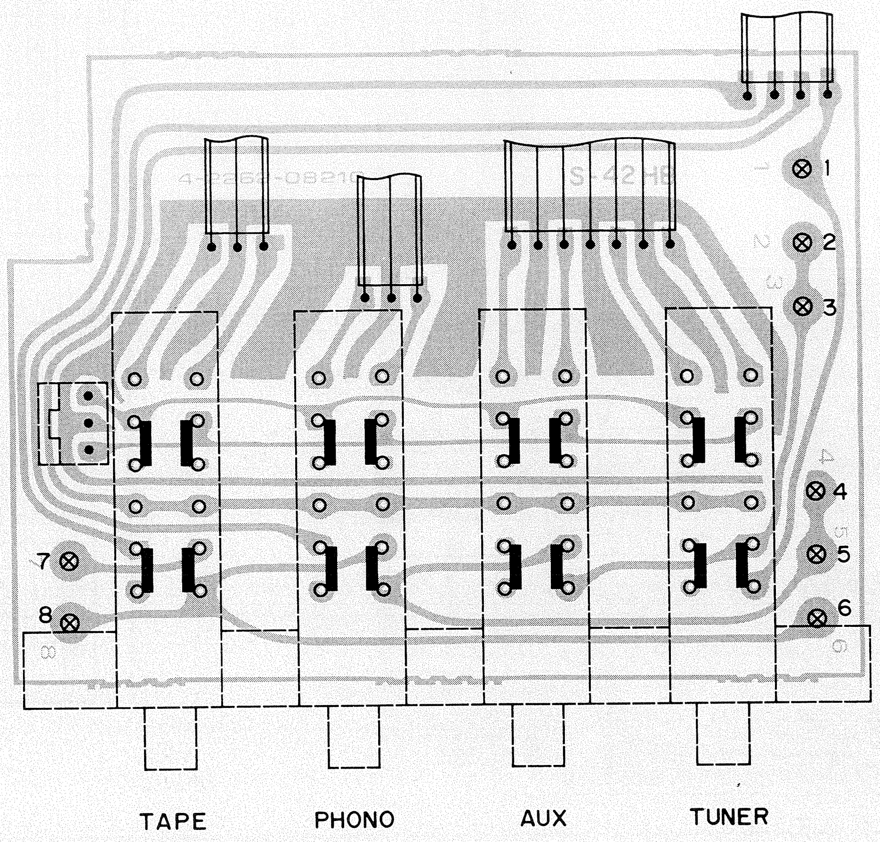
PRE AMPLIFIER P.C.BOARD

(BOTTOM VIEW)


TK-TC 94HB
R08 220
C08 100P
R06 220K
C06 1/50
C14 82P
R10 68K
C10 470P
R12 330
IC02 TA7322P
R14 560K
R07 220
C13 82P
IC01 TA7322P
C05 1/50
C07 100P
R05 220K
R13 560K
R11 330
R09 68K
C09 470P
C16 10/25
C15 10/25
R20 1.5K
C12 10/25
R19 1.5K
R21 680K
C27 47/25
C28 47/25
R34 1K 1/2W
R33 1K 1/2W
C11 10/25
R02 4.7K
R01 4.7K
C02 680P
R04 15K
C01 680P
C03 0.015
R03 15K
C04 0.015
R22 680K
4-2262-08200
R26 15K
R25 15K
R31 560
R32 560
R27 2.7K
R28 2.7K
C21 0.15
C22 0.15
C25 0.033
C26 0.033
C24 0.0039
C20 0.022
C19 0.022
R30 470
R29 470
C23 0.0039
E
VR02
BALANCE
250K-MNx2
S6
LOUDNESS
S9
SUBSONIC
S5
MODE
VR04
TREBLE
100KCx2
VR03
BASS
100KCx2

FUNCTION P.C.BOARD

(BOTTOM VIEW)


4-2262-08210
S-42HB
1
2
3
4
5
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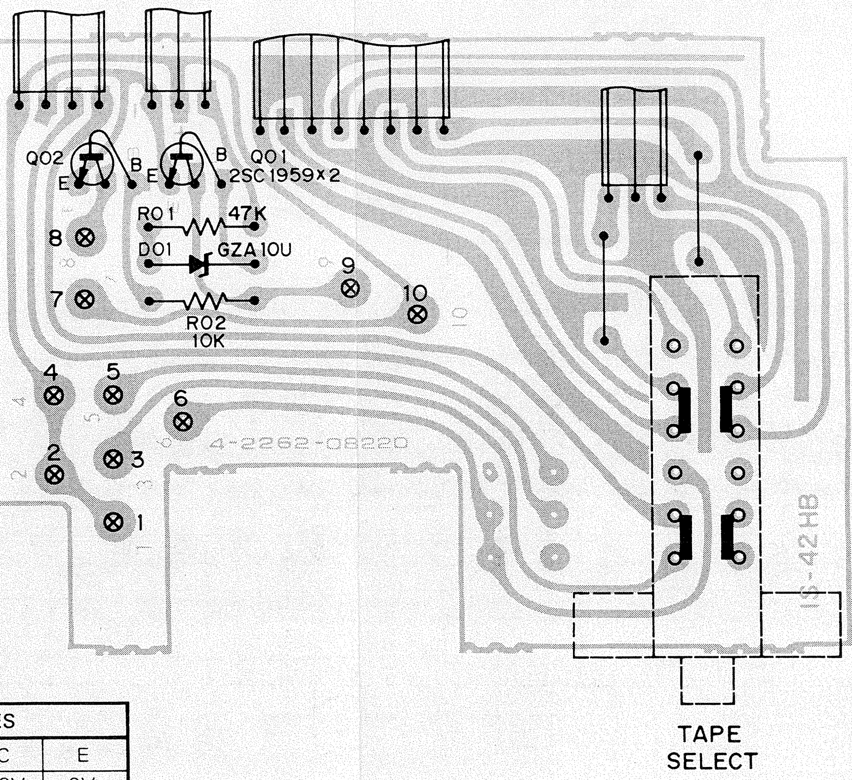
7
8
TAPE
PHONO
AUX
TUNER

PHONO/TAPE SELECT P.C.BOARD

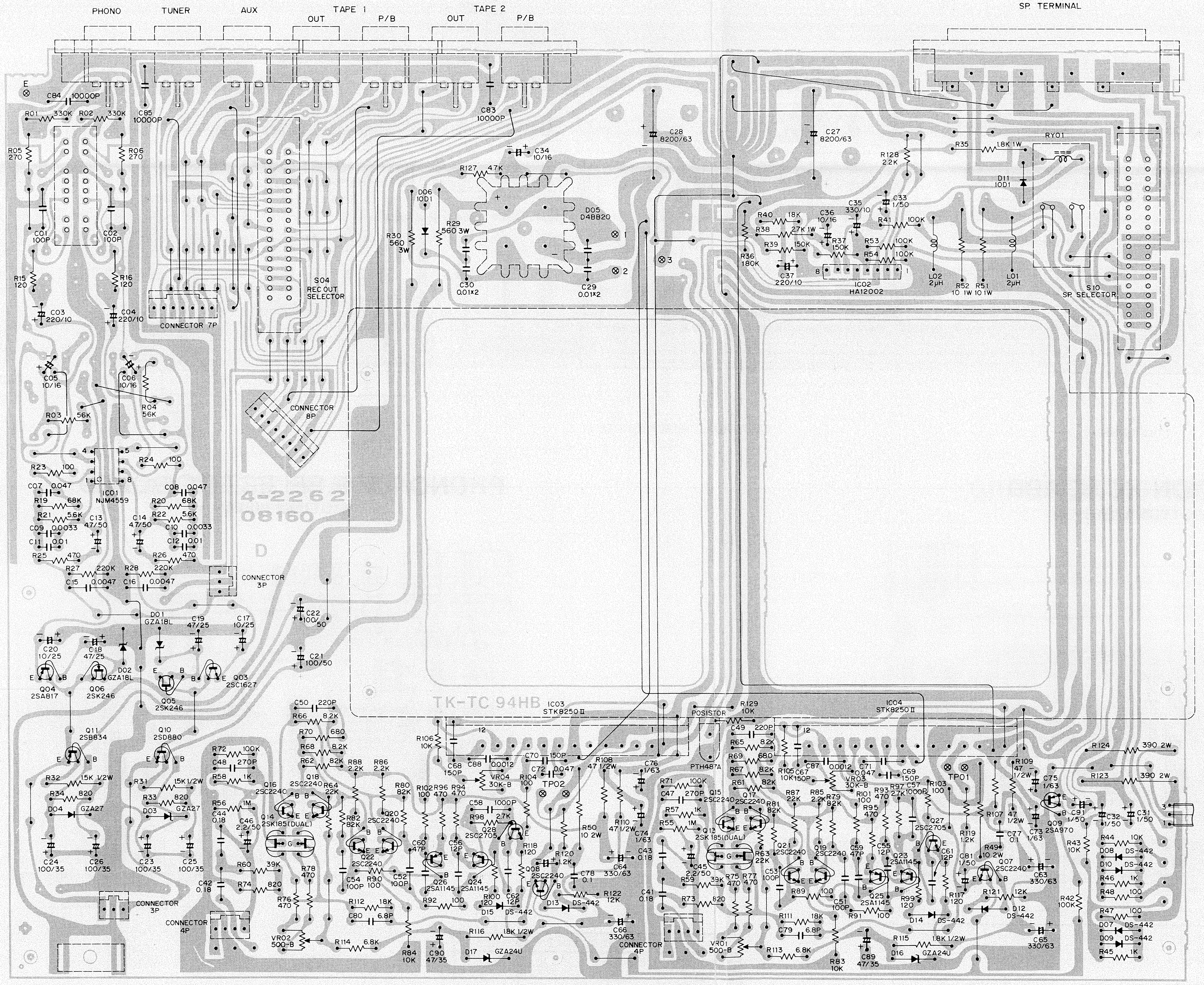
(BOTTOM VIEW)


Q02
Q01
2SC1959x2
E
B
R01 47K
D01 GZA10U
R02 10K
4-2262-08220
S-42HB
1
2
3
4
5
6
7
8
9
10
TAPE
SELECT

TRANSISTOR DC VOLTAGES				
SYMBOL No.	DEVICE	B	C	E
Q01	2SC1959	0.4V	7.6V	0V
Q02	2SC1959	0.7V	168mV	0V

MAIN, EQ, POWER SUPPLY P.C.BOARD

(BOTTOM VIEW)


PHONO
TUNER
AUX
TAPE 1
OUT
P/B
TAPE 2
OUT
P/B
SP. TERMINAL
E
C84 10000P
R01 330K
R02 330K
C85 10000P
C83 10000P
R05 270
R06 270
C01 100P
C02 100P
R15 120
R16 120
C03 220/10
C04 220/10
CONNECTOR 7P
S04 REC OUT SELECTOR
C05 10/16
C06 10/16
R03 56K
R04 56K
CONNECTOR 8P
R23 100
R24 100
IC01 NJM4559
C07 0.047
C08 0.047
R19 68K
R20 68K
R21 5.6K
R22 5.6K
C13 47/50
C14 47/50
C09 0.0033
C10 0.0033
C11 0.01
C12 0.01
R25 470
R26 470
R27 220K
R28 220K
C15 0.0047
C16 0.0047
CONNECTOR 3P
C22 100/50
C21 100/50
D01 GZA18L
C19 47/25
C17 10/25
C20 10/25
C18 47/25
D02 GZA18L
Q04 2SA817
Q06 2SK246
Q05 2SK246
Q03 2SC1627
Q11 2SB834
Q10 2SD880
R32 15K 1/2W
R31 15K 1/2W
R34 820
R33 820
D04 GZA27
D03 GZA27
C24 100/35
C26 100/35
C23 100/35
C25 100/35
CONNECTOR 3P
CONNECTOR 4P
C28 8200/63
C27 8200/63
C34 10/16
R127 4.7K
D06 10D1
R29 560 3W
R30 560 3W
D05 D4BB20
C30 0.01x2
C29 0.01x2
R128 2.2K
R35 1.8K 1W
RY01
D11 10D1
R40 18K
R38 27K 1W
C36 10/16
C35 330/10
C33 1/50
R41 100K
R39 150K
R37 150K
R53 100K
R54 100K
R36 180K
C37 220/10
IC02 HA12002
L02 2μH
R52 10 1W
R51 10 1W
L01 2μH
S10 SP. SELECTOR
4-2262
08160
TK-TC 94HB
IC03 STK8250Ⅱ
IC04 STK8250Ⅱ
POSISTOR
R129 10K
PTH487A
C50 220P
C49 220P
R66 8.2K
R65 8.2K
R70 680
R69 680
R68 8.2K
R67 8.2K
R62 82K
R61 82K
R72 100K
R71 100K
C48 270P
C47 270P
R58 1K
R57 1K
R56 1M
R55 1M
C44 0.18
C43 0.18
C46 2.2/50
C45 2.2/50
Q16 2SC2240
Q15 2SC2240
Q18 2SC2240
Q17 2SC2240
Q14 2SK185(DUAL)
Q13 2SK185(DUAL)
R64 22K
R63 22K
R88 2.2K
R86 2.2K
R87 22K
R85 2.2K
R82 82K
R81 82K
R80 82K
R79 82K
Q22 2SC2240
Q21 2SC2240
Q20 2SC2240
Q19 2SC2240
R60 39K
R59 39K
R74 820
R73 820
R78 470
R77 470
R76 470
R75 470
C42 0.18
C41 0.18
R106 10K
C68 150P
C88 0.0012
C87 0.0012
C70 150P
C69 150P
C72 0.047
C71 0.047
VR04 30K-B
VR03 30K-B
R102 100
R101 100
R96 470
R94 470
R93 470
R95 470
R104 100
R103 100
TP02
TP01
R108 47 1/2W
R110 47 1/2W
C76 1/63
R109 47 1/2W
R107 47 1/2W
C75 1/63
C58 1000P
C57 1000P
R98 2.7K
R97 2.7K
Q28 2SC2705
Q27 2SC2705
C60 47P
C59 47P
C56 12P
C55 12P
Q26 2SA1145
Q25 2SA1145
Q24 2SA1145
Q23 2SA1145
R118 120
R117 120
R120 1.2K
R119 1.2K
R50 10 2W
R49 10 2W
Q08 2SC2240
Q07 2SC2240
C78 0.1
C77 0.1
C74 1/63
C73 1/63
Q09 2SA970
C54 100P
C53 100P
R90 100
R89 100
C52 100P
C51 100P
R92 100
R91 100
R100 120
R99 120
C62 12P
C61 12P
D15 DS-442
D13 DS-442
D14 DS-442
R122 12K
R121 12K
D12 DS-442
C64 330/63
C63 330/63
C66 330/63
C65 330/63
R112 18K
R111 18K
C80 6.8P
C79 6.8P
VR02 500-B
VR01 500-B
R114 6.8K
R113 6.8K
R84 10K
R83 10K
C90 47/35
C89 47/35
R116 18K 1/2W
R115 18K 1/2W
D17 GZA24U
D16 GZA24U
R124 390 2W
R123 390 2W
C91 1/50
C32 1/50
C31 1/50
R44 10K
R43 10K
D08 DS-442
D10 DS-442
R46 1K
R48 100
R42 100K
R47 100
D07 DS-442
D09 DS-442
R45 1K
CONNECTOR 4P
C81 1/50

IC PIN NUMBERS DC VOLTAGES

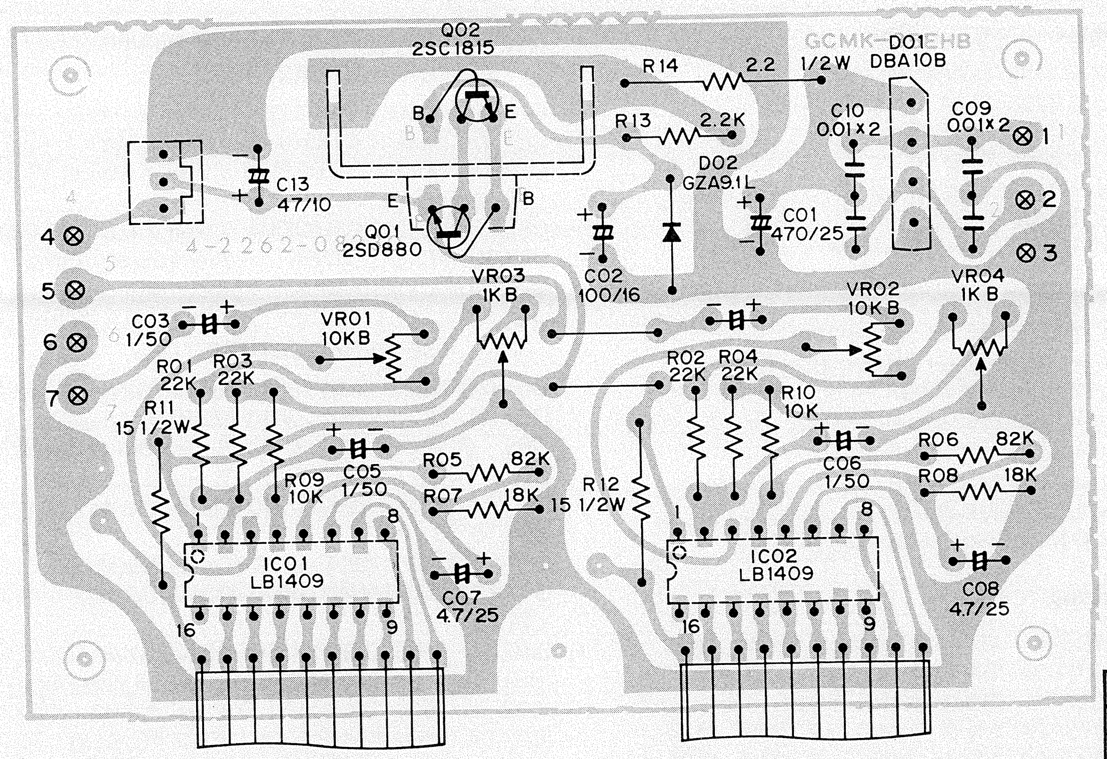
SYMBOL No.	DEVICE	1	2	3	4	5	6	7	8	9	10	11	12
IC01	NJM4559	−0.3mV	1.7mV	1.2mV	−17.2V	1.2mV	1.7mV	−0.3mV	17.2V	–	–	–	–
IC02	HA12002	0.8V	0V	177mV	1mV	−3.4V	22mV	6.7V	4.2V	–	–	–	–
IC03,04	STK8250Ⅱ	41.6V	0.9V	0.8V	0.8V	–	−41.6V	1.1V	0.7V	0.5V	0.3V	1.2V	1.4V

TRANSISTOR DC VOLTAGES

SYMBOL No.	DEVICE	B	C	E	SYMBOL No.	DEVICE	B	C	E	SYMBOL No.	DEVICE	B	C	E
Q03	2SC1627	17.8V	25.6V	17.2V	Q09	2SA970	–	29mV	41.6V	Q19,20	2SC2240	27.6V	38.2V	27.0V
Q04	2SA817	−17.5V	−25.8V	−16.9V	Q10	2SD880	26.2V	34.5V	25.6V	Q21,22	2SC2240	27.6V	38.4V	27.0V
Q05	2SK246	17.8V	25.6V	17.8V	Q11	2SB834	−27.7V	−34.2V	−27.1V	Q23,24	2SA1145	38.3V	−29.2V	38.9V
Q06	2SD246	−25.8V	−25.8V	−17.5V	Q15,16	2SC2240	8.3V	27.6V	7.7V	Q25,26	2SA1145	38.2V	1.5V	38.8V
Q07,08	2SC2240	0.8V	–	0.8V	Q17,18	2SC2240	8.3V	27.6V	7.7V	Q27,28	2SC2705	−39.6V	–	−40.2V

LEVEL IND. P.C.BOARD

(BOTTOM VIEW)

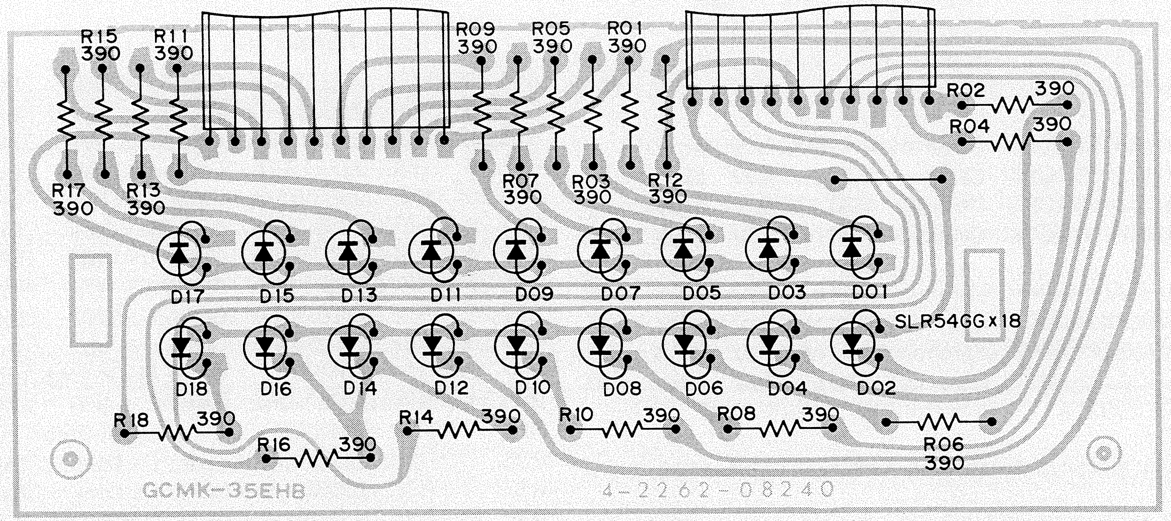

Q02
2SC1815
B
E
R14
2.2
1/2W
D01
DBA10B
GCMK-35EHB
R13
2.2K
C10
0.01×2
C09
0.01×2
1
2
3
C13
47/10
D02
GZA9.1L
E
B
C01
470/25
Q01
2SD880
4
5
6
7
4-2262-08
C02
100/16
VR03
1KB
VR02
10KB
VR04
1KB
C03
1/50
VR01
10KB
R01
22K
R03
22K
R02
22K
R04
22K
R10
10K
R11
15 1/2W
C06
1/50
R06
82K
R08
18K
R09
10K
C05
1/50
R05
82K
R07
18K
R12
15 1/2W
8
1
IC01
LB1409
IC02
LB1409
C07
4.7/25
C08
4.7/25
16
9

TRANSISTOR DC VOLTAGES				
SYMBOL No.	DEVICE	B	C	E
Q01	2SD880	8.2V	11.8V	7.6V
Q02	2SC1815	8.8V	11.8V	8.2V

IC PIN NUMBERS DC VOLTAGES																	
SYMBOL No.	DEVICE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
IC01,02	LB1409	7.6V	2.7V	61mV	0.3V	2.0V	0V	0.3V	0.3V	0.3V	0.3V	0.3V	0.3V	0.3V	0.3V	4.9V	–

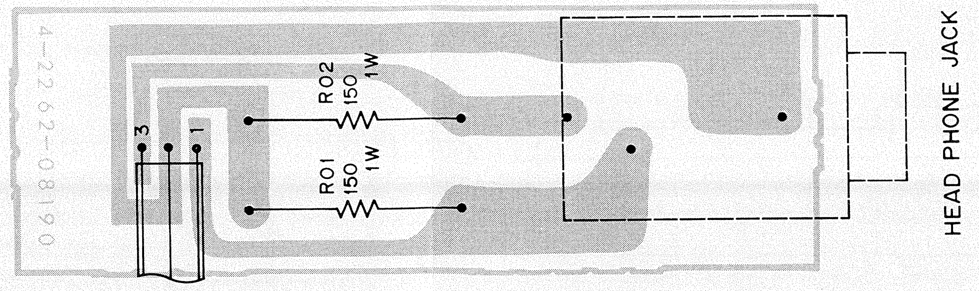
L.E.D. P.C.BOARD

(BOTTOM VIEW)


R15
390
R11
390
R09
390
R05
390
R01
390
R02
390
R04
390
R17
390
R13
390
R07
390
R03
390
R12
390
D17
D15
D13
D11
D09
D07
D05
D03
D01
SLR54GG×18
D18
D16
D14
D12
D10
D08
D06
D04
D02
R18
390
R16
390
R14
390
R10
390
R08
390
R06
390
GCMK-35EHB
4-2262-08240

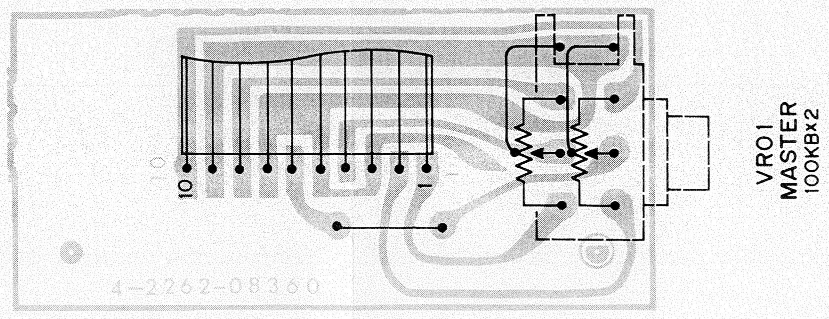
HEADPHONE JACK P.C.BOARD

(BOTTOM VIEW)

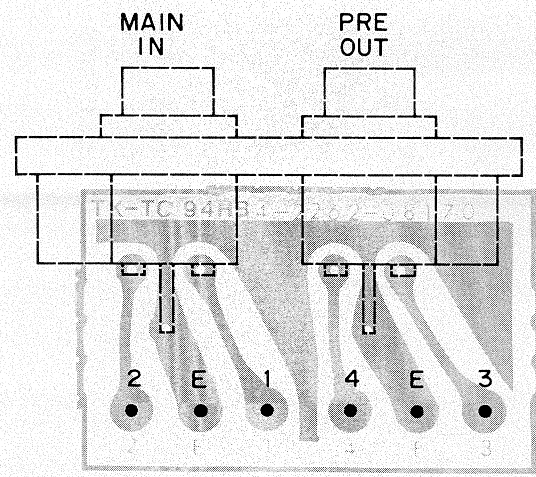

4-2262-08190
3
1
R02
150
1W
R01
150
1W
HEAD PHONE JACK

VOLUME CONTROL P.C.BOARD

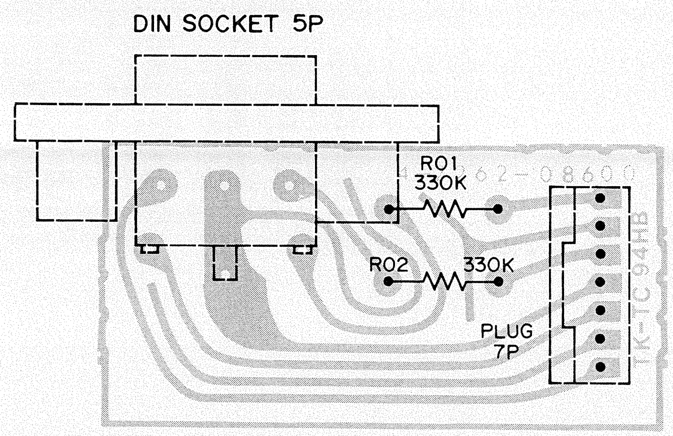
(BOTTOM VIEW)


10
1
VR01
MASTER
100KB×2
4-2262-08360

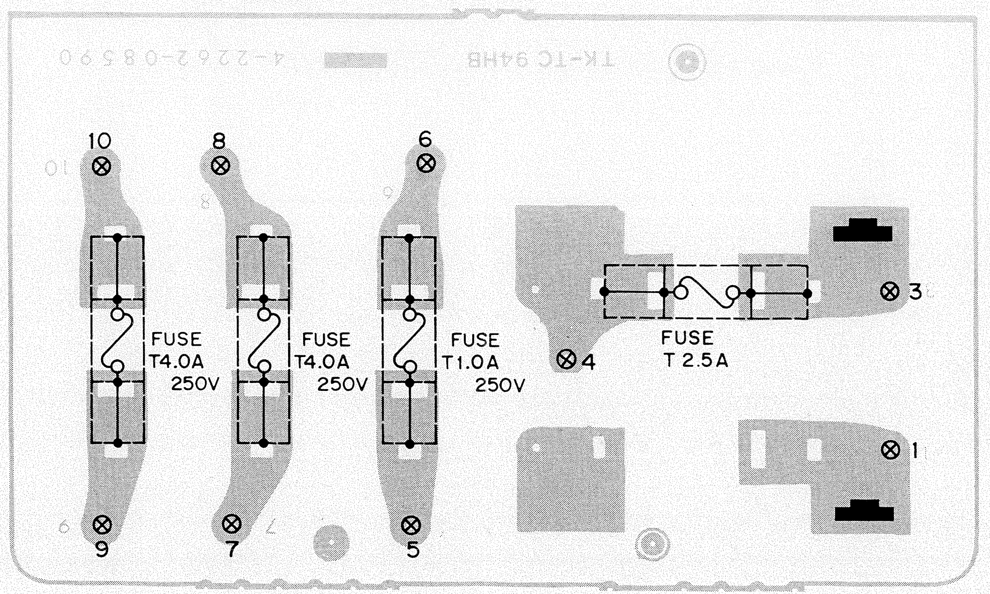
RCA PIN P.C.BOARD
(BOTTOM VIEW)



DIN P.C.BOARD
(BOTTOM VIEW)



FUSE P.C.BOARD
(BOTTOM VIEW)



PARTS LIST

MAIN, EQ, Power P.C.B. Assy
131 0 4001 07056

Ref. No.	Parts Number	Description
	4 2359 23180	Socket 4P
	4 2359 23220	RCA 6P Jack
	4 2362 00360	Plug 4P
	4 2362 00400	Plug 7P
	4 2362 00410	Plug 8P
	4 2362 00440	Plug 3P
	4 2372 00900	Earth Terminal
	4 2372 00960	Terminal 8P
RY01 ⚠	4 2322 00170	Relay
S04	4 2312 02580	Switch Slide 4-6
S10	4 2312 02600	Switch Slide 6-4
L01,02	4 2532 00180	RF Filter
VR01	4 2222 01490	VR 500-B
VR02	4 2222 01490	VR 500-B
VR03	4 2222 02120	VR 30k-B
VR04	4 2222 02120	VR 30k-B
	HLL-PTH487A-BE	Posistor PTH487A
	CAPACITORS	
C01,02	C1HCZJ101SPA	Ceramic 100 pF 50V ±5%
C03,04	C1ARY-227APA	Electrolytic 220 μF 10V
C05,06	C1CRY-106APA	Electrolytic 10 μF 16V
C07,08	C1HFYK473APA	Mylar 0.047 μF 50V ±10%
C09,10	C1HFYK332APA	Mylar 0.0033 μF 50V ±10%
C11,12	C1HFRK103A	Mylar 0.01 μF 50V ±10%
C13,14	C1HRY-475APA	Electrolytic 4.7 μF 50V
C15,16	C1HCZN472XPA	Ceramic 0.0047 μF 50V ±30%
C17	C1ERY-106APA	Electrolytic 10 μF 25V
C18,19	C1ERY-476APA	Electrolytic 47 μF 25V
C20	C1ERY-106APA	Electrolytic 10 μF 25V
C21,22	C1HRE-107A	Electrolytic 100 μF 50V
C23,24 25,26	C1VRE-100A	Electrolytic 100 μF 35V
C27,28	4 2232 00580	Electrolytic 8200 μF 63V
C29,30	4 2232 00430	Ceramic 0.01 μFx2 250V
C31,32 33	C1HRY-105APA	Electrolytic 1 μF 50V
C34	C1CRY-106APA	Electrolytic 10 μF 16V
C35	C1ARE-337A	Electrolytic 330 μF 10V
C36	C1CRY-106APA	Electrolytic 10 μF 16V
C37	C1ARE-227A	Electrolytic 220 μF 10V
C41,42 43,44	C1HFRJ184ML	Mylar 0.18 μF 50V ±5%
C45,46	C1HRY-225APA	Electrolytic 2.2 μF 50V
C47,48	C1HCZK271BPA	Ceramic 270 pF 50V ±10%
C49,50	C1HCZK221BPA	Ceramic 220 pF 50V ±10%
C51,52 53,54	C1HCZJ101SPA	Ceramic 100 pF 50V ±5%
C55,56	C1HCZJ120CPA	Ceramic 12 pF 50V ±5%
C57,58	C1HCZK102BPA	Ceramic 1000 pF 50V ±10%
C59,60	C1HCZJ470SPA	Ceramic 47 pF 50V ±5%
C61,62	C1HCZJ120CPA	Ceramic 12 pF 50V ±5%
C63,64 65,66	C1JRE-337A	Electrolytic 330 μF 63V
C67,68 69,70	C1HCZK151BPA	Ceramic 150 pF 50V ±10%
C71,72	C1HFYK473APA	Mylar 0.047 μF 50V ±10%
C73,74	C1JRY-105APA	Electrolytic 1 μF 63V
C75,76	C1JRE-105A	Electrolytic 1 μF 63V
C77,78	C1HFRK104A	Mylar 0.1 μF 50V ±10%

Ref. No.	Parts Number	Description
	CAPACITORS	
C79,80	C1HCZK6R8CPA	Ceramic 6.8 pF 50V ±10%
C81,82	C1HRY-105APA	Electrolytic 1 μF 50V
C83,84 85	C1ECZM103XPA	Ceramic 10000 pF 25V ±20%
C87,88	C1HCZM122DPA	Ceramic 0.0012 μF 50V ±20%
C89,90	C1VRE-476A	Electrolytic 47 μF 35V
C91	C1HRE-105A	Electrolytic 1 μF 50V
	SEMICONDUCTORS	
D01,02	202 5 3210 18010	Diode, GZA 18L
D03,04	202 5 3220 27010	Diode, GZA 27
D05 ⚠	DDD-D4BB20	Bridge Diode, D4BB20
D06	DCC-10D1	Diode, 10D1
D07,08 09,10	205 5 9040 44210	Diode, DS-442
D11	DCC-10D1	Diode, 10D1
D12,13 14,15	205 5 9040 44210	Diode, DS-442
D16,17	202 5 3210 24020	Diode, GZA24U
IC01	IJJ-NJM4559DX	IC, NJM4559DX
IC02	IKK-HA12002	IC, HA12002
IC03,04	206 5 5908 25010	IC, STK8250-II
Q03	TTT-2SC1627AY	TR 2SC1627A
Q04	TTT-2SA817--Y	TR 2SA817-Y
Q05,06	TTT-2SK246--GR	FET 2SK246
Q07,08	TTT-2SC2240-BL	TR 2SC2240 BL
Q09	TTT-2SA970--BL	TR 2SA970 BL
Q10	TTT-2SD880--GR	TR 2SD880 GR
Q11	TTT-2SB834--GR	TR 2SB834 GR
Q13,14	TVV-2SK185	FET (Dual) 2SK185
Q15,16 17,18 19,20 21,22	TTT-2SC2240-BL	TR 2SC2240 BL
Q23,24 25,26	TTT-2SA1145-Y	TR 2SA1145 Y
Q27,28	TTT-2SC2705-Y	TR 2SC2705 Y
	RESISTORS	
R01,02	R2EDZJ334APA	Carbon 330k 1/4W ±5%
R03,04	R2EDZJ563APA	Carbon 56k 1/4W ±5%
R05,06	R2EDZJ271APA	Carbon 270 1/4W ±5%
R15,16	R2EEZJ121APA	Carbon 120 1/4W ±5%
R19,20	R2EDZJ683APA	Carbon 68k 1/4W ±5%
R21,22	R2EDZJ562APA	Carbon 5.6k 1/4W ±5%
R23,24	R2EDZJ101APA	Carbon 100 1/4W ±5%
R25,26	R2EDZJ471APA	Carbon 470 1/4W ±5%
R27,28	R2EDZJ224APA	Carbon 220k 1/4W ±5%
R29,30	R3WEPK561A	Cemen 560 3W ±10%
R31,32	R2HXBJ152A	Oxide Metal Film 1.5k 1/2W ±5%
R33,34	R2EDZJ821APA	Carbon 820 1/4W ±5%
R35	R3AXBJ182A	Oxide Metal Film 1.8k 1W ±5%
R36	R2EDZJ184APA	Carbon 180k 1/4W ±5%
R37	R2EDZJ154APA	Carbon 150k 1/4W ±5%
R38	R3AXBJ272A	Oxide Metal Film 2.7k 1W ±5%
R39	R2EDZJ154APA	Carbon 150k 1/4W ±5%
R40	R2EDZJ183APA	Carbon 18k 1/4W ±5%
R41,42	R2EDZJ104APA	Carbon 100k 1/4W ±5%

PARTS LIST (Continued)

Ref. No.	Parts Number	Description
	RESISTORS	
R43,44	R2EDZJ103APA	Carbon 10k 1/4W ±5%
R45,46	R2EDZJ102APA	Carbon 1k 1/4W ±5%
R47,48	R2EDZJ101APA	Carbon 100 1/4W ±5%
R49,50	R3DXBJ100A	Oxide Metal Film 10 2W ±5%
R51,52	R3AXBJ100A	Oxide Metal Film 10 1W ±5%
R53,54	R2EDZJ104APA	Carbon 100k 1/4W ±5%
R55,56	R2EDZJ105APA	Carbon 1M 1/4W ±5%
R57,58	R2EDZJ102APA	Carbon 1k 1/4W ±5%
R59,60	R2EDZJ393APA	Carbon 39k 1/4W ±5%
R61,62	R2EDZJ823APA	Carbon 82k 1/4W ±5%
R63,64	R2EDZJ223APA	Carbon 22k 1/4W ±5%
R65,66 67,68	R2EDZJ822APA	Carbon 8.2k 1/4W ±5%
R69,70	R2EDZJ681APA	Carbon 680 1/4W ±5%
R71,72	R2EDZJ104APA	Carbon 100k 1/4W ±5%
R73,74	R2EDZJ821APA	Carbon 820 1/4W ±5%
R75,76 77,78	R2EDZJ471APA	Carbon 470 1/4W ±5%
R79,80 81,82	R2EDZJ823APA	Carbon 82k 1/4W ±5%
R83,84	R2EDZJ103APA	Carbon 10k 1/4W ±5%
R85,86 87,88	R2EDZJ222APA	Carbon 2.2k 1/4W ±5%
R89,90 91,92	R2EDZJ101APA	Carbon 100 1/4W ±5%
R93,94 95,96	R2EDZJ471APA	Carbon 470 1/4W ±5%
R97,98	R2EDZJ272APA	Carbon 2.7k 1/4W ±5%
R99,100	R2EDZJ121APA	Carbon 120 1/4W ±5%
R101,102 103,104	R2EDZJ101APA	Carbon 100 1/4W ±5%
R105,106	R2EDZJ103APA	Carbon 10k 1/4W ±5%
R107,108 109,110	R2HZPK470A	Fuse 47 1/2W ±10%
R111,112	R2EDZJ183APA	Carbon 18k 1/4W ±5%
R113,114	R2EDZJ682APA	Carbon 6.8k 1/4W ±5%
R115,116	R2HXBJ182A	Oxide Metal Film 1.8k 1/2W ±5%
R117,118	R2EDZJ121APA	Carbon 120 1/4W ±5%
R119,120	R2EDZJ122APA	Carbon 1.2k 1/4W ±5%
R121,122	R2EDZJ123APA	Carbon 12k 1/4W ±5%
R123,124	R3DXBJ391A	Oxide Metal Film 390 2W ±5%
R127	R2EDZJ472APA	Carbon 4.7k 1/4W ±5%
R128	R2EDZJ222APA	Carbon 2.2k 1/4W ±5%
R129	R2EDZJ103APA	Carbon 10k 1/4W ±5%

TAPE SELECT P.C.B. Assy
131 0 4001 07111

Ref. No.	Parts Number	Description
	131 0 4006 22229	Cord Assy
	131 0 4006 22237	Cord Assy
S02	4 2312 03500	Switch Push 1Key
	SEMICONDUCTORS	
D01	202 5 3210 10020	Diode, GZA10U
Q01,02	TTT-2SC1959-Y	TR 2SC1959 Y

Ref. No.	Parts Number	Description
	RESISTORS	
R01	R2EDZJ473APA	Carbon 47k 1/4W ±5%
R02	R2EDZJ103APA	Carbon 10k 1/4W ±5%

FUNCTION P.C.B. Assy
131 0 4001 07100

Ref. No.	Parts Number	Description
	4 2312 02540	Switch Push 4Key
	4 2362 00440	Plug 3P
	131 0 4006 22231	Cord Assy
	131 0 4006 22244	Cord Assy

PRE AMP P.C.B. Assy
131 0 4001 07091

Ref. No.	Parts Number	Description
J01	131 0 4006 22237	Cord Assy
J02	131 0 4006 22214	Cord Assy
J03	131 0 4006 22200	Cord Assy
J04	131 0 4006 22213	Cord Assy
S03	4 2312 02610	Switch Push 2Key (Subsonic, Mode)
S06	4 2312 03910	Switch Push 1Key (Loudness)
VR02	4 2222 01351	VR 250k-MNx2 (Balance)
VR03	4 2222 01341	VR 100k-Cx2 (Bass)
VR04	4 2222 01341	VR 100k-Cx2 (Treble)
	CAPACITORS	
C01,02	C1HCZK681BPA	Ceramic 680 pF 50V ±10%
C03,04	C1HFYK153APA	Mylar 0.015 μF 50V ±10%
C05,06	C1HRY-105APA	Electrolytic 1 μF 50V
C07,08	C1HCZJ101SPA	Ceramic 100 pF 50V ±5%
C09,10	C1HCZK471BPA	Ceramic 470 pF 50V ±10%
C11,12	C1ERY-106APA	Electrolytic 10 μF 25V
C13,14	C1HCZJ820SPA	Ceramic 82 pF 50V ±5%
C15,16	C1ERY-106APA	Electrolytic 10 μF 25V
C19	C1HFRK223A	Mylar 0.022 μF 50V ±10%
C20	C1HFYK223APA	Mylar 0.022 μF 50V ±10%
C21,22	C1HFRK154A	Mylar 0.15 μF 50V ±10%
C23,24	C1HFYK392APA	Mylar 0.0039 μF 50V ±10%
C25,26	C1HFYK333APA	Mylar 0.033 μF 50V ±10%
C27,28	C1ERY-476APA	Electrolytic 47 μF 25V
	SEMICONDUCTORS	
IC01,02	ITT-TA7322P	IC, TA7322P
	RESISTORS	
R01,02	R2EDZJ472APA	Carbon 4.7k 1/4W ±5%
R03,04	R2EDZJ153APA	Carbon 15k 1/4W ±5%
R05,06	R2EDZJ224APA	Carbon 220k 1/4W ±5%
R07,08	R2EDZJ221APA	Carbon 220 1/4W ±5%
R09,10	R2EDZJ683APA	Carbon 68k 1/4W ±5%
R11,12	R2EDZJ331APA	Carbon 330 1/4W ±5%
R13,14	R2EDZJ564APA	Carbon 560k 1/4W ±5%
R19,20	R2EDZJ152APA	Carbon 1.5k 1/4W ±5%

PARTS LIST (Continued)

Ref. No.	Parts Number	Description
	RESISTORS	
R21,22	R2EDZJ684APA	Carbon 680k 1/4W ±5%
R25,26	R2EDZJ153APA	Carbon 15k 1/4W ±5%
R27,28	R2EDZJ272APA	Carbon 2.7k 1/4W ±5%
R29,30	R2EDZJ471APA	Carbon 470 1/4W ±5%
R31,32	R2EDZJ561APA	Carbon 560 1/4W ±5%
R33,34	R2HXBJ102A	Oxide Metal Film 1k 1/2W±5%

VOLUME P.C.B. Assy
131 0 4001 07161

Ref. No.	Parts Number	Description
VR01	4 2222 02240	VR 100k-Bx2

RCA PIN P.C.B. Assy
131 0 4001 07063

Ref. No.	Parts Number	Description
	4 2359 23180	Socket 4P

L.E.D. P.C.B. Assy
131 0 4001 07130

Ref. No.	Parts Number	Description
	SEMICONDUCTORS	
D01,02 03,04,05,06,07,08 09,10,11,12,13,14 15,16,17,18	DYY-SLR-54GG	L.E.D., SLR-54GG (Green)
	RESISTORS	
R01,02 03,04,05,06,07,08 09,10,11,12,13,14 15,16,17	R2EDZJ391APA	Carbon 390 1/4W ±5%
R18	R2EDPJ391A	Carbon 390 1/4W ±5%

DIN P.C.B. Assy
131 0 4001 07150

Ref. No.	Parts Number	Description
	4 2352 00780	DIN Socket 5P
	RESISTORS	
R01,02	R2EDZJ334APA	Carbon 330k 1/4W ±5%

LEVEL IND. P.C.B. Assy
131 0 4001 07124

Ref. No.	Parts Number	Description
	4 2362 00440	Plug 3P
	131 2 6201 28000	Plate Heat Sink
VR01	4 2222 01400	VR 10k-B
VR02	4 2222 01400	VR 10k-B
VR03	4 2222 00990	VR 1k-B
VR04	4 2222 00990	VR 1k-B
	CAPACITORS	
C01	C1ERE-477A	Electrolytic 470 µF 25V
C02	C1CRE-107A	Electrolytic 100 µF 16V
C03,04 05,06	C1HRY-105APA	Electrolytic 1 µF 50V
C07,08	C1ERY-475APA	Electrolytic 4.7 µF 25V
C09,10	4 2232 00430	Ceramic 0.01 µFx2 250V
C13	C1ARY-476APA	Electrolytic 47 µF 10V
	SEMICONDUCTORS	
D01	202 5 4610 01010	Diode, DBA-10B
D02	202 5 3210 09110	Diode, GZA9.1L
IC01,02	206 5 2441 40910	IC, LB1409
Q01	TTT-2SD880--GR	TR 2SD880 GR
Q02	TTT-2SC1815-BL	TR 2SC1815 BL
	RESISTORS	
R01,02 03,04	R2EDZJ223APA	Carbon 22k 1/4W ±5%
R05,06	R2EDZJ823APA	Carbon 82k 1/4W ±5%
R07,08	R2EDZJ183APA	Carbon 18k 1/4W ±5%
R09,10	R2EDZJ103APA	Carbon 10k 1/4W ±5%
R11,12	R2HXBJ150A	Oxide Metal Film 15 1/2W ±5%
R13	R2EDZJ222APA	Carbon 2.2k 1/4W ±5%
R14	R2HXBJ2R2A	Oxide Metal Film 2.2 1/2W ±5%

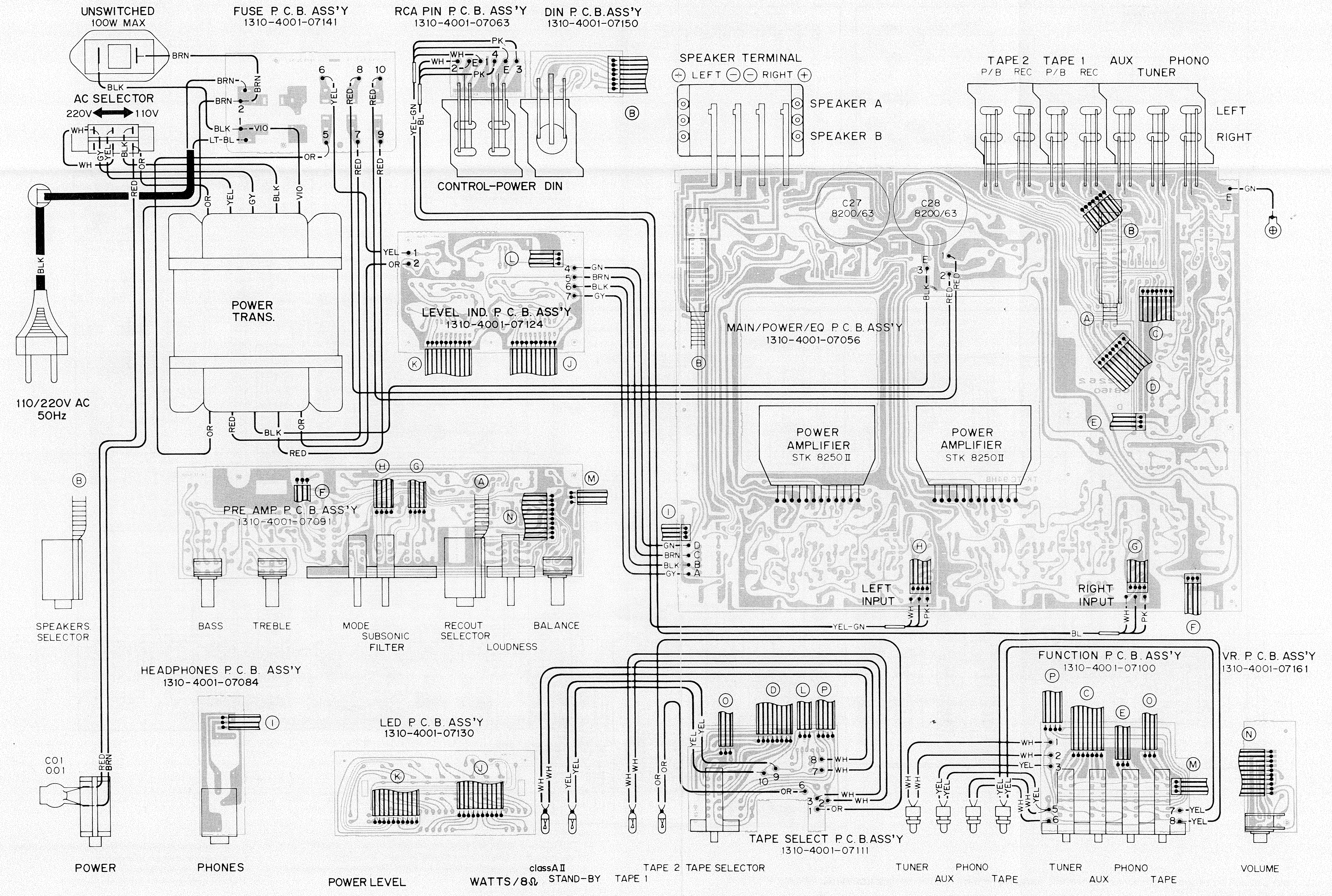
FUSE P.C.B. Assy
131 0 4001 07141

Ref. No.	Parts Number	Description
⚠	4 2349 20380	Fuse T 1.0A
⚠	4 2349 20570	Fuse T 2.5A
⚠	4 2349 20590	Fuse T 4.0A
	4 2352 00200	Fuse Hold Clip

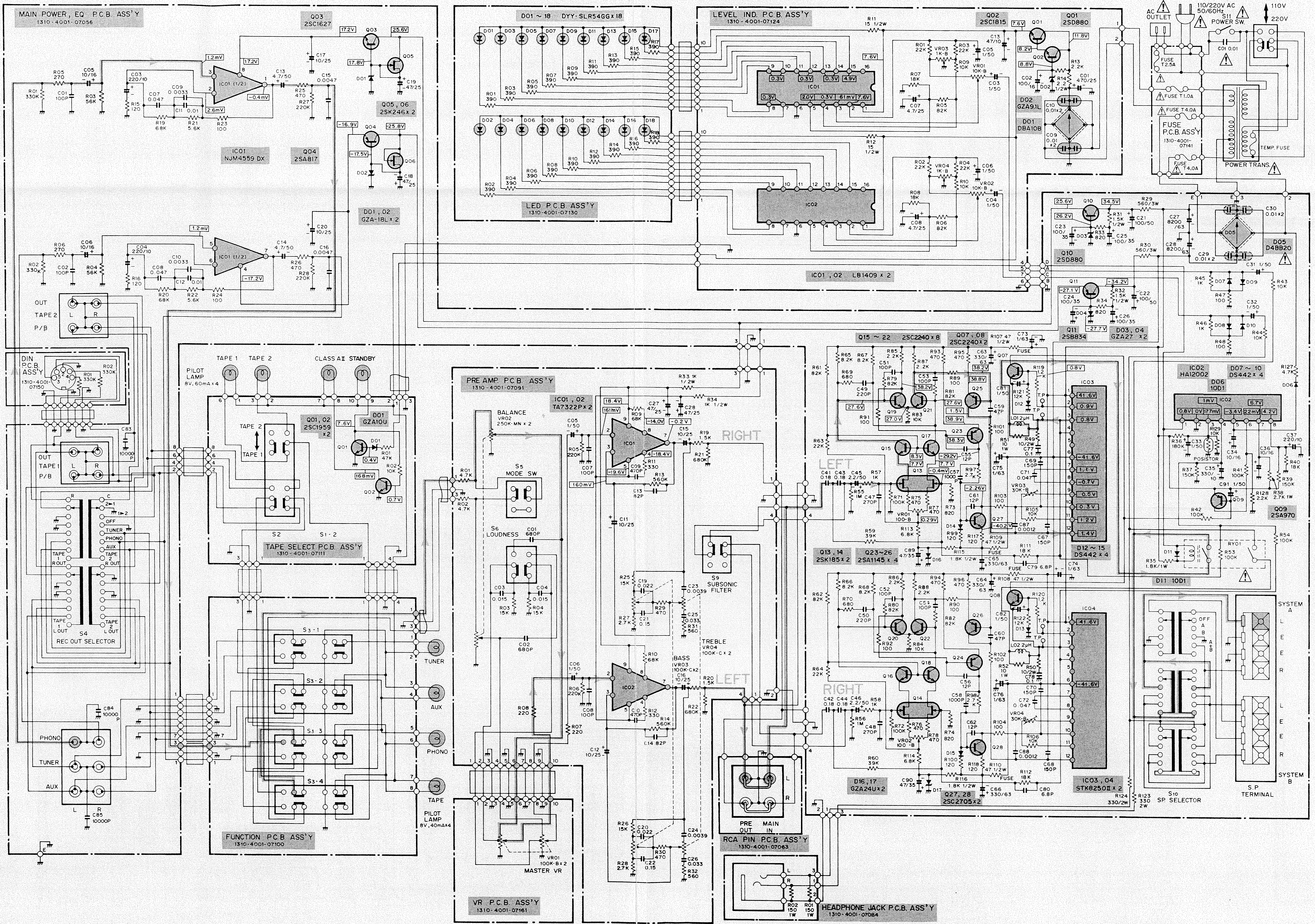
HEADPHONE P.C.B. Assy
131 0 4001 07084

Ref. No.	Parts Number	Description
	4 2352 00970	Headphone Jack 3P
	RESISTORS	
R01,02	R3AXBJ151A	Oxide Metal Film 150 1W ±5%

POINT TO POINT WIRING DIAGRAM


UNSWITCHED
100W MAX
FUSE P. C. B. ASS'Y
1310-4001-07141
RCA PIN P. C. B. ASS'Y
1310-4001-07063
DIN P. C. B. ASS'Y
1310-4001-07150
AC SELECTOR
220V
110V
BRN
BLK
VIO
LT-BL
WH
GY
YEL
OR
RED
PK
CONTROL-POWER
DIN
SPEAKER TERMINAL
LEFT
RIGHT
SPEAKER A
SPEAKER B
TAPE 2
P/B
REC
TAPE 1
AUX
TUNER
PHONO
LEFT
RIGHT
GN
C27
8200/63
C28
8200/63
POWER
TRANS.
110/220V AC
50Hz
LEVEL IND. P. C. B. ASS'Y
1310-4001-07124
MAIN/POWER/EQ P. C. B. ASS'Y
1310-4001-07056
POWER
AMPLIFIER
STK 8250 II
PRE AMP P. C. B. ASS'Y
1310-4001-07091
LEFT
INPUT
RIGHT
INPUT
YEL-GN
BL
SPEAKERS
SELECTOR
BASS
TREBLE
MODE
SUBSONIC
FILTER
RECOUT
SELECTOR
LOUDNESS
BALANCE
HEADPHONES P. C. B. ASS'Y
1310-4001-07084
LED P. C. B. ASS'Y
1310-4001-07130
FUNCTION P. C. B. ASS'Y
1310-4001-07100
VR. P. C. B. ASS'Y
1310-4001-07161
TAPE SELECT P. C. B. ASS'Y
1310-4001-07111
C01
0.01
POWER
PHONES
POWER LEVEL
WATTS/8Ω
classA II
STAND-BY
TAPE 2
TAPE 1
TAPE SELECTOR
TUNER
AUX
PHONO
TAPE
TUNER
AUX
PHONO
TAPE
VOLUME

SCHEMATIC DIAGRAM


MAIN POWER, EQ. P.C.B. ASS'Y 1310-4001-07056
ICO1 NJM4559 DX
Q03 2SC1627
Q04 2SA817
Q05, 06 2SK246 x 2
D01, 02 GZA-18L x 2
D01 ~ 18 DYY-SLR54GG x 18
LED P.C.B. ASS'Y 1310-4001-07130
LEVEL IND. P.C.B. ASS'Y 1310-4001-07124
IC01, 02 LB1409 x 2
Q01 2SD880
Q02 2SC1815
D02 GZA9.1L
D01 DBA10B
AC OUTLET
110/220V AC 50/60Hz
S11 POWER SW.
110V
220V
FUSE P.C.B. ASS'Y 1310-4001-07141
POWER TRANS.
TEMP. FUSE
Q10 2SD880
Q11 2SB834
D03, 04 GZA27 x 2
D05 D4BB20
TAPE 2 OUT P/B
TAPE 1 OUT P/B
DIN P.C.B. ASS'Y 1310-4001-07150
S4 REC OUT SELECTOR
PHONO
TUNER
AUX
PILOT LAMP 8V, 60mA x 4
TAPE 1
TAPE 2
CLASS AII
STANDBY
Q01, 02 2SC1959 x 2
D01 GZA10U
S2
S1-2
TAPE SELECT P.C.B. ASS'Y 1310-4001-07111
S3-1
S3-2
S3-3
S3-4
FUNCTION P.C.B. ASS'Y 1310-4001-07100
PRE AMP. P.C.B. ASS'Y 1310-4001-07091
IC01, 02 TA7322P x 2
BALANCE VR02 250K-MN x 2
S5 MODE SW
S6 LOUDNESS
S9 SUBSONIC FILTER
BASS VR03 100K-C x 2
TREBLE VR04 100K-C x 2
RIGHT
LEFT
VR P.C.B. ASS'Y 1310-4001-07161
VR01 100K-B x 2 MASTER VR
PILOT LAMP 8V, 40mA x 4
RCA PIN P.C.B. ASS'Y 1310-4001-07063
PRE OUT
MAIN IN
HEADPHONE JACK P.C.B. ASS'Y 1310-4001-07084
Q15 ~ 22 2SC2240 x 8
Q07, 08 2SC2240 x 2
Q13, 14 2SK185 x 2
Q23~26 2SA1145 x 4
D16, 17 GZA24U x 2
Q27, 28 2SC2705 x 2
IC03
IC04
IC03, 04 STK8250II x 2
D12 ~ 15 DS442 x 4
IC02 HA12002
D07 ~ 10 DS442 x 4
D06 10D1
Q09 2SA970
D11 10D1
RY01
S10 SP SELECTOR
S.P. TERMINAL
SYSTEM A
SYSTEM B

Because Fisher products are subject to continuous improvement, Fisher Corporation reserves the right to make any changes or modifications without notice.

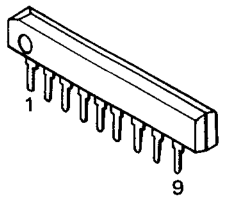
NOTES:

1. All resistors values are indicated in "ohm" ($K=10^3$, $M=10^6$).
2. All capacitors values are indicated in "μF" ($P=10^{-12}$).
3. All voltages indicated on the schematics are measured under the following conditions.
   - a. Use a V.T.V.M.
   - b. All voltages ±10% with respect to chassis ground
   - c. No signals at input terminals
   - d. AC input at 220 volts 50 Hz
4. This is a basic schematic diagram.

SEMICONDUCTOR LEAD IDENTIFICATION

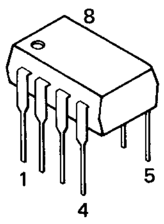
INTEGRATED CIRCUITS

TONE AMP IC



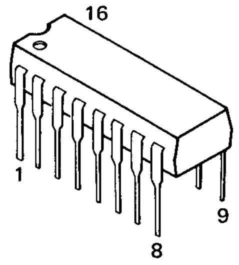
- TA7322P

EQ AMP IC



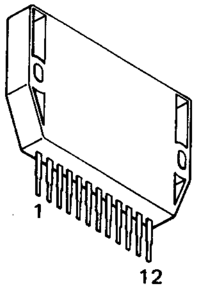
- NJM4559DX

L.E.D. LEVEL METER IC



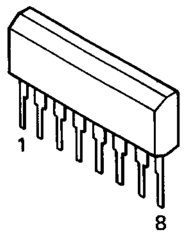
- LB1409

POWER AMP IC



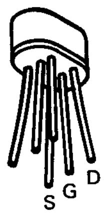
- STK8250II

PROTECTOR CIRCUIT MONO AMP IC

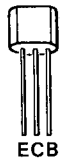


- HA12002

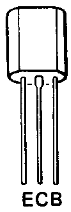
TRANSISTORS



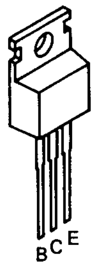
- 2SK185



- 2SA970
- 2SC1815
- 2SC1959
- 2SC2240

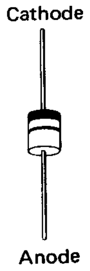


- 2SA817
- 2SA1145
- 2SC1627A
- 2SC2705

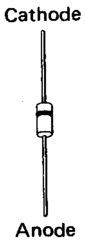


- 2SD880
- 2SB834

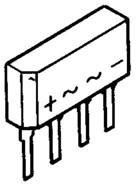
DIODES



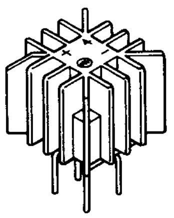
- 10D1



- GZA9.1L
- GZA10U
- GZA18L
- GZA24U
- GZA27
- DS-442



- DBA10B



- D4BB20

PRODUCT SAFETY NOTICE

PRODUCT SAFETY SHOULD BE CONSIDERED WHEN A COMPONENT REPLACEMENT IS MADE IN ANY AREA OF AN UNIT. COMPONENTS INDICATED BY A MARK ⚠ IN THIS SCHEMATIC DIAGRAM SHOW COMPONENTS WHOSE VALUE HAS SPECIAL SIGNIFICANCE TO PRODUCT SAFETY. IT IS PARTICULARLY RECOMMENDED THAT ONLY PARTS SPECIFIED ON THE ATTACHED PARTS LIST BE USED FOR COMPONENT REPLACEMENT POINTED OUT BY THE MARK.